

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER 9424.170US01
INTERNATIONAL APPLICATION NO. PCT/NL00/00599		U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) Unknown 10/049895
INTERNATIONAL FILING DATE August 29, 2000		PRIORITY DATE CLAIMED August 30, 1999
TITLE OF INVENTION COSMETICS COMPOSITION		
APPLICANT(S) FOR DO/EO/US VOSS, et al.		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
1. [X] This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371. 2. [ ] This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371. 3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Article 22 and 39(I). 4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. 5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. [X] is transmitted herewith (required only if not transmitted by the International Bureau). b. [X] has been transmitted by the International Bureau. c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US) 6. [ ] A translation of the International Application into English (35 U.S.C. 371(c)(2)). 7. [X] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau). b. [ ] have been transmitted by the International Bureau. c. [ ] have not been made; however, the time limit for making such amendments has NOT expired. d. [ ] have not been made and will not be made. 8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. [X] An unsigned oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <b>Items 11. to 16. below concern document(s) or information included:</b> 11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. [X] A FIRST preliminary amendment. [ ] A SECOND or SUBSEQUENT preliminary amendment 14. [ ] A substitute specification. 15. [ ] A change of power of attorney and/or address letter. 16. [X] Other items or information: Application Data Sheet; Form PCT/IPEA/409 with Amended Claim sheets; PCT/ISA/210		

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

INTERNATIONAL APPLICATION NO.

Unknown

10/049875

PCT/NL00/00599

1 10049895 101802

9424.170USWO

17. [X] The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492(a) (1)-(5)):**

Search Report has been prepared by the EPO or JPO.....\$890.00

International preliminary examination fee paid to USPTO  
(37 CFR 1.492(a)(1)).....\$710.00No international preliminary examination fee paid to USPTO (37 CFR 1.482)  
but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....\$740.00Neither international preliminary examination fee (37 CFR 1.482) nor  
international search fee (37 CFR 1.445(a)(3)) paid to USPTO.....\$1040.00International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(2)-(4).....\$100.00**CALCULATIONS** PTO USE ONLY**ENTER APPROPRIATE BASIC FEE AMOUNT =** \$890.00Surcharge of **\$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30  
months from the earliest claimed priority date (37 CFR 1.492(c)).

\$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	17	-20 = 0	X \$18.00	\$0.00
Independent claims	2	-3 = 0	X \$80.00	\$0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$

**TOTAL OF ABOVE CALCULATIONS =** \$890.00Reduction by 1/2 for filing by small entity, if applicable. Small entity status is claimed  
pursuant to 37 CFR 1.27

\$

**SUBTOTAL =** \$890.00Processing fee of **\$130.00** for furnishing the English translation later than [ ] 20 [ ] 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

+

\$

**TOTAL NATIONAL FEE =** \$890.00Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property

+

\$

**TOTAL FEES ENCLOSED =** \$890.00

Amount to be: refunded	\$
charged	\$

a. [X] Check(s) in the amount of \$890.00 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 13-2725**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

John J. Giesens  
MERCHANT & GOULD  
P.O. Box 2903  
Minneapolis, MN 55402-0903SIGNATURE: 

NAME: John J. Giesens

REGISTRATION NUMBER: 33,112

10/049895

JC10 Rec'd PCT/PTO 12 FEB 2002

S/N unknown

PATENTIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	VOSS et al.	Docket No.:	9424.170USWO
Serial No.:	unknown	Filed:	concurrent herewith
Int'l Appln No.:	PCT/NL00/00599	Int'l Filing Date:	August 29, 2000
Title:	COSMETICS COMPOSITION		

CERTIFICATE UNDER 37 CFR 1.10

'Express Mail' mailing label number: EL 669944187 US

Date of Deposit: February 12, 2002

I hereby certify that this correspondence is being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By: 

Name: Chris Stordahl

PRELIMINARY AMENDMENT

Box PCT

Assistant Commissioner for Patents  
Washington, D. C. 20231

Dear Sir:

In connection with the above-identified application filed herewith, please enter the following preliminary amendment, , based on claims amended in prosecution of the international application and published in the International Preliminary Examination Report, a copy of which is enclosed herewith:

IN THE ABSTRACT

Insert the attached Abstract page into the application as the last page thereof.

IN THE SPECIFICATION

A courtesy copy of the present specification is enclosed herewith. However, the World Intellectual Property Office (WIPO) copy should be relied upon if it is already in the U.S. Patent Office.

IN THE CLAIMS

Please amend claims 3-6 and 8-16 to read as follows:

3. (AMENDED) Composition according to claim 1, wherein the container is a plastic container.
4. (AMENDED) Composition according to claim 1, wherein said composition comprises at least two surfactants and a hydrophobic compound having a HLB-value of less than 10 wherein said composition further has a viscosity according the Brookfield (23°C, Spindle TE, 5 RPM) of in the range of 5,000 to 50,000 mPas.
5. (AMENDED) Composition according to claim 1, comprising from 0.01 to 30 wt.% of thickener, from 1 to 15 wt.% of propellant, from 0.5 to 50 wt.% of surfactant and the balance being water and other customary body care ingredients.
6. (AMENDED) Composition according to claim 1, wherein the thickener is chosen from the group of gums, poly(meth)acrylates, polymers based upon aerosil-types, polysaccharides, high molecular polyethyleneglycolmono- and diesters of fatty acids, polyacrylamides, polyvinylalcohols, polyvinylpyrrolidons, esters of fatty acids with polyols, fatty alcoholethoxylates, alkyloligoglucosides and sugar-esters.
8. (AMENDED) Composition according to claim 1 further comprising one or more ingredients chosen from the group of pH regulating agents, oil bodies, emulsifying agents, preservatives, perfumes, moisturizing agents, UV-filters, emollients, superfatting agents, brighteners, strength improving agents, silicon agents, fats, waxes, lecithins, phospholipids, stabilizing agents, anti-bacterial agents and other bioactive agents, odor-absorbing agents, antiperspirants, antidandruff agents, film-forming agents, swelling agents, antioxidants, insect-repellents, hydrotropes, tanning agents, tyrosin inhibitors, solubilizers and colorants.

9. (AMENDED) Composition according to claim 1, wherein said composition comprises a fatty alcohol preferably of the formula  $R_1OH$ ,  $R_1$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms and 0, 1, 2 or 3 double bonds.

10. (AMENDED) Composition according to claim 1, wherein said composition comprises a fatty alcoholalkoxylate preferably of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms,  $m$  being an integer from 1 to 30 and  $AlkO$  being an alkyleneoxide.

11. (AMENDED) Composition according to claim 1, wherein said composition comprises a fatty alcoholalkoxylate of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 8 to 22 carbon atoms,  $m$  being an integer from 5 to 20 and  $AlkO$  being chosen from ethyleneoxide and propylene oxide.

12. (AMENDED) Composition according to claim 4, wherein the viscosity according to Brookfield (23°C, Spindle TE, 5 RPM) of said composition is in the range of 10,000 to 50,000, preferably in the range of 20,000 to 30,000 mPas.

13. (AMENDED) Composition according to claim 1 wherein said composition is a gel.

14. (AMENDED) Composition according to claim 1 wherein said composition comprises:

- a) 0.01 to 30 % w/w of a thickener,
- b) 0.1 to 20 % w/w of a hydrophobic compound having an HLB value of less than 10,
- c) 0.5 to 40 % anionic surfactants,
- d) 0.25 to 5 % amphoteric surfactants, and/or

e) 0.5 to 40 % nonionic surfactants,

and is further characterized by the composition having a viscosity of 5,000 to 50,000 mPas and the weight ratio of components c:d or c:e being in the range of 2:1 to 8:1.

15. (AMENDED) Container comprising a cosmetics composition according to claim

1.

16. (AMENDED) Use of a composition according to claim 1 as a sun cream or lotion, body milk, shampoo, bathing or shower gel, ointment, deodorant, hair care product or moisturizing cream.

REMARKS

The above preliminary amendment is made to remove multiple dependencies from claims 3-6 and 8-16.

A new abstract page is supplied to conform to that appearing on the publication page of the WIPO application, but the new Abstract is typed on a separate page as required by U.S. practice.

Applicants respectfully request that the preliminary amendment described herein be entered into the record prior to calculation of the filing fee and prior to examination and consideration of the above-identified application.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' primary attorney-of-record, John J. Gresens (Reg. No. 33,112), at (612) 371.5265.

Respectfully submitted,

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Dated: February 12, 2002

By

  
John J. Gresens  
Reg. No. 33,112

JJG/pjk

**ABSTRACT**

The invention relates to a cosmetics composition comprising a thickener, a propellant, a surfactant and water, wherein the composition is contained in a container under a pressure of not more than 3 bar.



## MARKED-UP COPY OF CLAIMS

3. Composition according to claim 1 [or 2], wherein the container is a plastic container.
4. Composition according to [any of the claims 1-3] claim 1, wherein said composition comprises at least two surfactants and a hydrophobic compound having a HLB-value of less than 10 wherein said composition further has a viscosity according to the Brookfield (23°C, Spindle TE, 5 RPM) of in the range of 5,000 to 50,000 mPas.
5. Composition according to [any of the preceding claims] claim 1, comprising from 0.01 to 30 wt.% of thickener, from 1 to 15 wt.% of propellant, from 0.5 to 50 wt.% of surfactant and the balance being water and other customary body care ingredients.
6. Composition according to [any of the preceding claims] claim 1, wherein the thickener is chosen from the group of gums, poly(meth)acrylates, polymers based upon acrosil-types, polysaccharides, high molecular polyethyleneglycolmono- and diesters of fatty acids, polyacrylamides, polyvinylalcohols, polyvinylpyrrolidons, esters of fatty acids with polyols, fatty alcoholethoxylates, alkyloligoglucosides and sugar-esters.
8. Composition according to [any of the preceding claims] claim 1 further comprising one or more ingredients chosen from the group of pH regulating agents, oil bodies, emulsifying agents, preservatives, perfumes, moisturizing agents, UV-filters, emollients, superfatting agents, brighteners, strength improving agents, silicon agents, fats, waxes, lecithins, phospholipids, stabilizing agents, anti-bacterial agents and other bioactive agents, odor-absorbing agents, antiperspirants, antidandruff agents, film-forming agents, swelling agents, antioxidants, insect-repellents, hydrotropes, tanning agents, tyrosin inhibitors, solubilizers and colorants.

9. Composition according to [any of the preceding claims] claim 1, wherein said composition comprises a fatty alcohol preferably of the formula  $R_1OH$ ,  $R_1$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms and 0, 1, 2 or 3 double bonds.

10. Composition according to [any of the preceding claims] claim 1, wherein said composition comprises a fatty alcoholalkoxylate preferably of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms,  $m$  being an integer from 1 to 30 and  $AlkO$  being an alkyleneoxide.

11. Composition according to [any of the preceding claims] claim 1, wherein said composition comprises a fatty alcoholalkoxylate of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 8 to 22 carbon atoms,  $m$  being an integer from 5 to 20 and  $AlkO$  being chosen from ethyleneoxide and propylene oxide.

12. Composition according to [any of the] claim 4 [to 11], wherein the viscosity according to Brookfield (23°C, Spindle TE, 5 RPM) of said composition is in the range of 10,000 to 50,000, preferably in the range of 20,000 to 30,000 mPas.

13. Composition according to [any of the preceding claims] claim 1 wherein said composition is a gel.

14. Composition according to [any of the preceding claims] claim 1 wherein said composition comprises:

- a) 0.01 to 30 % w/w of a thickener,
- b) 0.1 to 20 % w/w of a hydrophobic compound having an HLB value of less than 10,
- c) 0.5 to 40 % anionic surfactants,
- d) 0.25 to 5 % amphoteric surfactants, and/or

e) 0.5 to 40 % nonionic surfactants,

and is further characterized by the composition having a viscosity of 5,000 to 50,000 mPas and the weight ratio of components c:d or c:e being in the range of 2:1 to 8:1.

15. Container comprising a cosmetics composition according to [any of the preceding claims] claim 1.

16. Use of a composition according to [any of the claims 1-14] claim 1 as a sun cream or lotion, body milk, shampoo, bathing or shower gel, ointment, deodorant, hair care product or moisturizing cream.

Title: Cosmetics composition

The invention relates to a cosmetics composition and to its use.

Cosmetics compositions are nowadays available in many different forms. One product having a very distinct appearance from another product may nevertheless serve the same purpose as said other product. Examples of the wide variety that cosmetics may have include lotions, gels, creams, ointments, milks, aerosols, pastes and so forth.

The present invention seeks to provide a new form for a cosmetics composition. The objective form is a viscous composition, preferably a gel, which, after application to the skin, creates a post-application foaming effect. When the gel is contacted with the skin, it is desired that a noticeable transition takes place from a gel to a dense creamy foam. To achieve this goal, the invention provides a cosmetics composition comprising a thickener, a propellant, a surfactant and water, wherein the composition is contained in a container under a pressure of no more than 3 bar.

Surprisingly, it has been found that a propellant can be incorporated into a cosmetics composition wherein the resultant pressure is less than that of the propellant on its own. Additionally, the propellant is incorporated into the cosmetics composition substantially without affecting the stability of the composition, even if the composition has the form of a gel. When the composition is applied to the skin, the propellant is released from the gel and the user experiences a foam which is very rich, creamy and long-lasting. It has further been found that the composition is non-flammable and as such is associated with a reduced risk for consumers with respect to fire and explosion hazards.

It is to be noted that cosmetics compositions in the form of a gel and comprising a propellant are known per se. In the field of shaving creams, gels are marketed which, due to the presence of a propellant, convert into a foaming layer or lather when brought into contact with the skin. More recently, this technology has been modified to allow shower foam products to be marketed. These compositions are generally packaged in containers having two compartments, e.g. a bag made of a laminated material suspended inside an aerosol can. Moreover, the amount of propellant needed in these compositions is relatively high. Hence, shaving gels are packed into pressurized containers wherein the pressure usually is as high as 8 bar or

more. Consequently, the container needs to be particularly strong and is therefore made of metal.

A composition according to the invention does not require such high amounts of propellant. As has been mentioned, the pressure in a container in which the composition is contained may be as low as 3 bar or less. Preferably, said pressure is lower than 2 bar. Due to this low pressure, the present composition may advantageously be packed in a plastic container, e.g. a polyethylene or polypropylene container, which is economically much more attractive than package in a metal container. Furthermore, a composition according to the invention has been found to have a lower pressure at elevated temperatures than expected. This feature is advantageous in that it can often not be avoided that the product needs to be stored at elevated temperatures for a certain period of time. It is to be noted that the pressure refers to an absolute pressure. Furthermore, the pressure will be in excess of atmospheric pressure, i.e. an overpressure of at least 0.1 bar.

It is preferred that the present composition has the form of a gel. Accordingly, the composition comprises a thickener, which is preferably present in an amount of from 0.01 to 30 wt.%, more preferably from 0.5 to 10 wt.%, even more preferably from 1 to 3 wt.%, based on the weight of the composition. Suitable thickeners are chosen for the compatibility with the propellant and for their capability to provide a stable viscous product, more in particular a stable gel. For many applications a suitable viscosity is a viscosity of 5,000 to 50,000, preferably 10,000 to 50,000, and more preferably 20,000 to 30,000 mPas, measured as Brookfield viscosity (23°C, spindle TE, 5 Rpm), e.g. to employ in cleansing gels, face cleansing gels, face care gels, gels for masks, and similar compositions which are commonly used in body care.

Examples of thickeners to be used in compositions according to the present invention include side chain modified polymers based on aerosil-types (hydrophilic silicic acids), polysaccharides such as xanthan gum, guar-guar, agar-agar, alginates and tyloses, carboxymethylcellulose, hydroxyethylcellulose, high molecular polyethylene glycol mono- and diesters of fatty acids, polyacrylates (e.g. Carbopole® of Goodrich or Synthalene® of Sigma), polyacrylamide, polyvinyl alcohols and polyvinylpyrrolidone. Particularly, thickeners with associate action, such as fatty acid glycerides, esters of fatty acids with polyols such as pentaerythritol or trimethylolpropane,

fatty alcohol ethoxylates, optionally with EO-homologue distribution, alkyloligoglucosides and sugar esters may be used.

In accordance with the invention, highly preferred thickeners are gums and poly(meth)acrylates, such as polyacrylic acid. Particularly stable gels have been obtained using xanthan gum as the thickener. The presence of a molecular network is highly beneficial to the stability of the gel and can be demonstrated in rheological measurements.

A further important component of the present composition is a propellant. Advantageously, the propellant is chosen for its physico-chemical properties and the character of the foam texture produced on application to skin. A further consideration on which the choice for a suitable propellant may be based is its environmentally friendly character. Possible propellants are hydrocarbons, such as alkanes having from 1 to 12 carbon atoms. Preferred propellants are hydrocarbons with 4 to 7 carbon atoms, such as linear or branched alkanes, including cyclic ones. Particularly good results have been obtained using isopentane as a propellant. The propellant is preferably present in an amount suitable to achieve the desired pressure of the composition in a container in which it is packed. Suitable amounts range from 0.1 to 20 wt.%, preferably from 1 to 15 wt.%, more preferably from 4 to 8 wt.%, based on the weight of the composition.

Furthermore it has been found unexpectedly that alkanes in combination with thickeners, can yield highly viscous mixtures, of a gel-like nature. In cosmetic or pharmaceutical applications, these gel-like mixtures demonstrate a high stability, also when the temperature is decreased. Another advantage of compositions according to the invention may be, the pleasant sensation to the skin, compositions according to the invention may give rise to.

The composition further comprises one or more surfactants. Preferably, the surfactant or surfactants are foaming and skin friendly. Possible surfactants include anionic, nonionic and/or amphoteric surfactants. Typical examples of anionic surfactants include soaps, alkylbenzol sulfonates, alkane sulfonates, olefin sulfonates, alkyl ether sulfonates, glycerine ether sulfonates,  $\alpha$ -methylester sulfonates, sulfofatty acids, alkyl sulfates, fatty alcohol ether sulfates, glycerine ether sulfates, fatty acid ether sulfates, hydroxy mixed ether sulfates, monoglyceride (ether) sulfates, fatty acid amide(ether) sulfates, mono- and dialkylsulfosuccinates, mono- and dialkyl sulfosuccinamates, sulfotriglycerides, amide soaps, ether carboxylic acids and

salts thereof, fatty acid isothionates, fatty acid sarcosinates, fatty acid taurides, N-acylamino acids such as acylactylate, acyltartrate, acylglutamate and acylaspartate, alkyloligoglucoside sulfates, protein fatty acid condensates and alkyl (ether) phosphates. Typical examples of nonionic surfactants include fatty alcoholpolyglycol ethers, alkylphenolpolyglycol ethers, fatty acid polyglycol esters, fatty acid amidpolyglycol ethers, fatty aminopolyglycol ethers, alkoxyated triglycerides, mixed ethers, optionally partially oxidized alk(en)yloligoglucosides or glucuronic acid derivatives, fatty acid-N-alkylcycamides, proteinhydrolysates, polyol fatty acid esters, sugar esters, sorbitan esters, polysorbates and amino-oxides. Typical examples of amphoteric or zwitterionic surfactants include alkyl betains, alkylamido betains, aminopropionates, aminoglycinates, imidazolinium betains and sulfo betains. Further reference, e.g. concerning the preparation of these compounds, may be made to J. Falbe (ed.), "Surfactants in Consumer Products", Springer Verlag, Berlin, 1987, p. 54-124 or J. Falbe (ed.), "Katalysatoren, Tenside und Mineralöladditive", Thieme Verlag, Stuttgart, 1978, p. 123-217. Examples of preferred surfactants include polysorbate 20 or 40, coco glucoside, lauryl glucoside, decyl glucoside, lauryl sulfates such as ammonium, sodium, magnesium, MEA, TEA, or Mipa lauryl sulfate, cocamidopropyl betain, and sodium alkyl sulfosuccinates. The surfactant is preferably present in an amount of from 0.5 to 50 wt.%, more preferably from 2 to 20 wt.% and most preferably from 8 to 13 wt.%, based on the weight of the composition.

It is possible to use a combination of ionic surfactants and amphoteric or non-ionic surfactants. Preferably the ionic surfactant is an anionic surfactant in such combinations. Typically the concentration ranges of such a composition comprising ionic surfactants and amphoteric or non-ionic surfactants are: 0.01 to 30 wt.% of a thickener, 0.1 to 20 wt.% of a hydrophobic compound having an HLB (hydrophilic/lipophilic balance) value of less than 10, 0.5 to 40 wt.% anionic surfactants, 0.25 to 5 wt.% amphoteric surfactants and/or 0.5 to 40 wt.% nonionic surfactants. Furthermore such combinations are preferably used in a ionic surfactant to amphoteric/non-ionic surfactant of in the range of 2:1 to 8:1 wt. to wt, more preferably in the range of 4:1 to 6:1 wt. to wt..

The present compositions may further comprise fatty alcohols, by which primary aliphatic alcohols of the formula  $R_1OH$  are meant, in which  $R_1$

is an aliphatic hydrocarbon group containing 6 to 22, preferably 10 to 18 carbon atoms and 0, 1, 2 or 3 double bonds. Typical examples are capron alcohol, capryl alcohol, 2-ethylhexyl alcohol, caprin alcohol, lauryl alcohol, isotridecyl alcohol, myristyl alcohol, cetyl alcohol, palmoleyl alcohol, stearyl alcohol, isostearyl alcohol, oleyl alcohol, elaidyl alcohol, petroselinyl alcohol, linolyl alcohol, linolenyl alcohol, elaeostearyl alcohol, arachyl alcohol, gadoleyl alcohol, behenyl alcohol, erucyl alcohol, and brassidyl alcohol and mixtures thereof. These compounds may be present in amounts of 0.1 to 20, preferably 0.5 to 10 wt.% based on the weight of the composition.

The present compositions may further comprise fatty alcohol ethoxylates, which may have the formula  $R_2O(AlkO)_mH$ , in which  $R_2$  is an aliphatic hydrocarbon group containing 6 to 22, preferably 10 to 18 carbon atoms and 0, 1, 2 or 3 double bonds,  $m$  is an integer from 1 to 30, preferably 5 to 20, more preferably 10 to 15, and  $AlkO$  is an alkylene oxide.  $AlkO$  may be chosen from ethylene oxide, propylene oxide and/or butylene oxide. These compounds may be present in amounts of 0.1 to 20, preferably 0.5 to 10 wt.% based on the weight of the composition.

Depending on the envisaged purpose of the composition, one or more other ingredients may be present. Examples of such ingredients include pH regulating agents, oil bodies, emulsifying agents, preservatives, perfumes, moisturizing agents, UV-filters, emollients, superfatting agents, brighteners, strength improving agents, silicon agents, fats, waxes, lecithins, phospholipids, stabilizing agents, anti-bacterial agents and other bioactive agents, odor-absorbing agents, antiperspirants, antidandruff agents, film-forming agents, swelling agents, antioxidants, insect-repellents, hydrotropes, tanning agents, tyrosin inhibitors, solubilizers and colorants. The composition may further comprise a conventional cosmetics base, such as water, oil, ointment etc..

The composition is preferably formulated to be a gel. In a preferred embodiment the gel transforms upon dispensing from a container into a soft and foamy mousse which cleans in a soft and silky manner.

The pH of the composition is preferably regulated to be close to the pH of the skin itself. Accordingly, the pH of the composition is preferably slightly acidic to slightly alkaline, e.g. in the range of 5 to 8. An example of a suitable pH regulating agent is citric acid. The skilled person will be aware of numerous suitable pH regulating agents that may be employed in the present



type of compositions. The amount of the pH regulating agent present is of course adjusted so that the desired pH is achieved.

Examples of suitable oil bodies are guarbeta-alcohols based upon fatty alcohols containing 6 to 18 or preferably 8 to 10 carbon atoms, esters of linear C<sub>6</sub>-C<sub>22</sub> fatty acids with linear C<sub>6</sub>-C<sub>22</sub> fatty alcohols, esters of branched C<sub>6</sub>-C<sub>13</sub> Carboxylic acids with linear C<sub>6</sub>-C<sub>22</sub> fatty alcohols, such as myristyl-myristate, myristyl-palmitate, myristyl-stearate, myristyl-isostearate, myristyl-oleate, myristyl-behenate, myristyl-erucate, cetyl-myristate, cetyl-palmitate, cetyl-stearate, cetyl-isostearate, cetyl-oleate, cetyl-behenate, cetyl-erucate, stearyl-myristate, stearyl-palmitate, stearyl-stearate, stearyl-isostearate, stearyl-oleate, stearyl-behenate, stearyl-erucate, isostearyl-myristate, isostearyl-palmitate, isostearyl-stearate, isostearyl-isostearate, isostearyl-oleate, isostearyl-behenate, isostearyl-oleate, oleyl-myristate, oleyl-palmitate, oleyl-stearate, oleyl-isostearate, oleyl-oleate, oleyl-behenate, oleyl-erucate, behenyl-myristate, behenyl-palmitate, behenyl-stearate, behenyl-isostearate, behenyl-oleate, behenyl-behenate, behenyl-erucate, erucyl-myristate, erucyl-palmitate, erucyl-stearate, erucyl-isostearate, erucyl-oleate, erucyl-behenate and erucyl-erucate. Other examples are esters of linear C<sub>6</sub>-C<sub>22</sub> fatty acids with branched alcohols, in particular with 2-ethylhexanol, esters of carboxylic acids with linear or branched C<sub>6</sub>-C<sub>22</sub> fatty alcohols, in particular dioctylmalates, esters of linear and/or branched fatty acids with multivalent alcohols, such as propyleneglycol, dimerdiols or trimetriols, and/or guarbeta-alcohols, triglycerides based upon C<sub>6</sub>-C<sub>10</sub> fatty acids, liquid mono-/di-/tri-glyceride mixtures based upon C<sub>6</sub>-C<sub>18</sub> fatty acids, esters of C<sub>6</sub>-C<sub>22</sub> fatty alcohols and/or guarbeta-alcohols with aromatic carboxylic acids, in particular benzoic acid, esters of C<sub>2</sub>-C<sub>12</sub> dicarboxylic acids with linear or branched alcohols having 1 to 22 carbon atoms or polyols with 2 to 10 carbon atoms and 2 to 6 hydroxyl groups, oils of vegetable origin, branched primary alcohols, substituted cyclohexanes, linear and branched C<sub>6</sub>-C<sub>22</sub> fatty alcohol carbonates, guarbeta-carbonates, esters of benzoic acid and linear and/or branched C<sub>6</sub>-C<sub>22</sub> alcohols, such as Finsolv® TN, linear or branched, symmetric or asymmetric dialkylethers having 6 to 22 carbon atoms per alkyl group, ring opening products of epoxy fatty acid esters and polyols, silicon-oils and/or aliphatic respectively naphthalenic hydrocarbons, such as squalane, squalene or dialkylcyclohexanes.

An emollient or moisturizing agent may be present in order to improve the ease of application of the composition and the final skin feel the user experiences. Examples of suitable emollients or moisturizing agents include glycerin, propenylglycol, PEG 7 glyceryl cocoate, PEG 6 caprylic or capric glycerides, glyceryl oleate and lipids in general, such as paraffin oil or polar oils. An emollient or moisturizing agent is preferably present in an amount ranging from 0.5 to 15 wt.%, based on the weight of the composition.

Suitable emulsifying agents are for example non-ionic surfactants such as:

- reaction products of 2 to 30 mole ethylene oxide and/or 0 to 5 mole propylene oxide with linear fatty alcohols having 8 to 22 carbon atoms, with fatty acids having 12 to 22 carbon atoms, with alkylphenols having 8 to 15 carbon atoms in the alkyl group and also with alkylamines having 8 to 22 carbon atoms in the alkyl group;
- alkyl and/or alkenyl-oligoglycosides having 8 to 22 carbon atoms in alk(en)yl group and ethoxylated analogs thereof;
- reaction products of 1 to 15 mole ethylene oxide and castor oil and/or fixated castor oil;
- reaction products of 15 to 60 mole ethylene oxide and castor oil and/or fixated ricinoleic oil;
- partial-esters of glycerin and/or sorbitane with unsaturated, linear or saturated, branched fatty acids having 12 to 22 carbon atoms and/or hydroxycarboxylic acids having 3 to 18 carbon atoms, as well as adducts thereof with 1 to 30 mole ethylene oxide;
- partial-esters of polyglycerin (average self-condensation degree 2 to 8), polyethyleneglycol (molecular weight of 400 to 5000), trimethylolpropane, pentaerythrite, sugar-alcohols, such as sorbitol, alkylglucosides, such as methylglucoside, butylglucoside, laurylglucoside, as well as polyglucosides, such as cellulose, with saturated and/or unsaturated, linear or branched fatty acids having 12 to 22 carbon atoms and/or hydroxycarboxylic acids having 3 to 18 carbon atoms, as well as adducts thereof with 1 to 30 mole ethylene oxide;

- mixed-esters of pentaerythrite, fatty acids, citric acid and fatty alcohols in accordance with DE 1165574 PS and/or mixed-esters of fatty acids having 6 to 22 carbon atoms, methylglucose and polyols, preferably glycerin or polyglycerin;
- 5 • mono-, di- and trialkylphosphates, as well as mono-, di- and/or tri-PEG-alkylphosphates and salts thereof;
- wool-wax alcohols;
- polysiloxan-polyalkyl-polyether-copolymers respectively derivatives thereof;
- 10 • polyalkylneglycols;
- glycerincarbonates;

The reaction products of ethylene oxide and/or propylene oxide with fatty alcohols, fatty acids, alkylphenols or ricinolic oils are commercially obtainable products. They are available as homologous mixtures, of which the average alkoxylation degree is in accordance with the mass ratio of ethylene oxide and/or propylene oxide and substrate, with which the reaction takes place. C<sub>12</sub>-C<sub>18</sub> fatty acid mono- and diesters of reaction products of ethylene oxide and glycerin are known in relation to cosmetic compositions from DE-2024051.

Typical examples of suitable partial-glycerides are monoglyceride-hydroxy-stearinate, diglyceridehydroxy-stearinate, monoglyceride-isostearinate, diglyceride-isostearinate, monoglyceride-oleiate, diglyceride-oleiate, monoglyceride-ricinoleate, diglyceride-ricinoleate, monoglyceride-linoleate, diglyceride-linoleate, monoglyceride-linolenate, diglyceride-linolenate monoglyceride-erucate, diglyceride-erucate, monoglyceride-tartrate, diglyceride-tartrate, monoglyceride-citrate, diglyceride-citrate, monoglyceride-malate, diglyceridemalate, as well as technical mixtures thereof, which may still contain small amounts of triglyceride, depending upon the production process. Reaction products of 1 to 30, preferably 5 to 10 mole ethylene oxide with aforementioned partial-glycerides are suitable too.

Examples of suitable sorbitol-esters are sorbitol-monoisostearate, sorbitol-sesquiosostearate, sorbitol-diisostearate, sorbitol-triisostearate, sorbitol-monooleate, sorbitol-sesguioleate, sorbitol-dioleate, sorbitol-trioleate, sorbitol-monoerucate, sorbitol-sesguierucate, sorbitol-dierucate, sorbitol-trierucate, sorbitol-monoricinoleate, sorbitol-sesquicrinoleate, sorbitol-di-

ricinoleate, sorbitol-triricinoleate, sorbitol-monohydroxystearate, sorbitol-sesqui-hydroxy-stearate, sorbitol-dihydroxystearate, sorbitol-trihydroxy-stearate, sorbitol-monotartrate, sorbitol-sesquitartrate, sorbitol-ditartrate, sorbitol-tritartrate, sorbitol-monocitrate, sorbitol-sesquicitrate, sorbitol-dicitrate, sorbitol-tricitrate, sorbitol-monomaleate, sorbitol-sesquimaleate, sorbitol-dimaleate, sorbitol-trimaleate as well as technical mixtures thereof. Reaction products of 1 to 30, preferably 5 to 10 mole ethylene oxide with said sorbitol esters are suitable too.

Typical examples of suitable polyglycerin esters are polyglyceryl-2 dipolyhydroxy-stearate (Dehymuls® PGPH), polyglycerin-3-diisostearate (Lameform® TGI), polyglyceryl-4 isostearate (Isolan® GI 34), polyglyceryl-3 oleate, diisostearyl polyglyceryl-3 diisostearate (Isolan® PDI), polyglyceryl-3 methylglucose distearate (Tego Care® 450), polyglyceryl-3 beeswax (Cera Bellina®), polyglyceryl-4 caprate (Polyglycerol Caprate T20 10/90), polyglyceryl-3 cetyl ether (Chimexane® NL), polyglyceryl-3 distearate (Cremophor® GS 32) and polyglyceryl polyricin-oleate (Admul® WOL 1403) polyglyceryl dimerateisostearate, as well as, mixtures thereof.

Further examples of suitable polyol esters are possibly with 1 to 30 mole ethylene oxide derivatized mono-, di- and triesters of trimethylolpropane or pentaerythrite with lauric acid, cocinic acid, palmic acid, talcum-oil acid, palmic acid, stearic acid, oleic acid, behenic acid and the like.

Cationic surfactants may also be suitable emulsifying agents. Preferred cationic surfactant are quaternary esters, in particular quaternary, methyl-di-fatty acid- triethanol-amine-ester salts.

Superfating agents may be compounds such as lanolin or lecithin as well as polyethoxyated or acylated lanolin- and lecithin derivatives, polyol fatty acid esters, monoglycerides and fatty acid alkanolamides, wherein fatty acid alkanolamides also tend to stabilizing the foam.

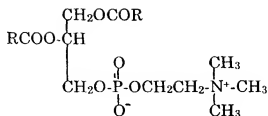
Brighteners may for example be selected from: alkylene glycolesters, in particular ethylene glycoldistearate, fatty acid alkanolamide, in particular cocinic acid diethanolamide; partial-glycerides, especially monoglyceridestearate; esters of multivalent, possibly hydroxyl substituted carboxylic acids with fatty alcohols having 6 to 22 carbon atoms, in particular esters with long chains of tartaric acid; fatty compounds, such as fatty acids, fatty ketones, fatty aldehydes, fatty ethers and fatty carbonates, which have a total of at least 24 carbon atoms, in particular laurin and distearyl ether; fatty

acids such as stearic acids, hydroxystearic acids or behenic acids, ring opening products of olefinepoxides having 12 to 22 carbon atoms with fatty alcohols having 12 to 22 carbon atoms and/or polyols having 2 to 15 carbon atoms and 2 to 10 hydroxyl groups, as well as mixtures thereof.

5 As strength improving agents, particularly suitable groups of compounds are e.g. C<sub>12</sub>-C<sub>22</sub> fatty alcohols or hydroxy- fatty alcohols, preferably having 16 to 18 carbon atoms. Partial-glycerides, fatty acids or hydroxy fatty acids are also examples of suitable strength improving agents. Preferred is a combination of these compounds with alkyloligoglucosides and/or fatty acids-  
10 N-methylglucamides of equal chain length and/or polyglycerinpoly-12-hydroxystearates.

Examples of suitable silicon compounds are dimethylpolysiloxanes, methylphenylpolysiloxanes, cyclic silicones, as well as amino-, fatty acid-, alcohol-, epoxy-, fluoro-, glycoside-, and/or alkylated silicon compounds, which  
15 may either be in a liquid phase or a resin phase, at room temperature. Other examples are dimethicones, in particular mixtures of dimethicones having an average chain length of 200 to 300 dimethylsiloxane moieties and hydrated silicates. A detailed overview of suitable volatile silicones can be found in Todd et al., Cosm. Toil. 91, 27 (1976).

20 Typical examples of fats are tri-glycerides. Suitable waxes are for example natural waxes, such as candililla wax, carnauba wax, Japan wax, esparto grass wax, ceric wax, guaruma wax, rice bran wax, sugar cane wax, orycury wax, montan wax, bees wax, shellac wax, walrat, lanolin (wool wax),  
25 tail root fat, ceresin, ozocerite (earth wax), petrolatum, paraffin wax, micro waxes, chemically modified waxes (hard waxes) such as montan ester waxes, sasol waxes, hydrated jujube waxes, as well as synthetic waxes, such as polyalkylene waxes and polyethyleneglycol waxes. In addition to fats, certain compounds that are similar to fats may be added, such as lecithins and phospholipids. With lecithins, the person skilled in the art means those  
30 glycerophospholipids, which can be formed by esterification of fatty acids, glycerin, phosphoric acids and choline. In the art, lecithins are therefor also often referred to as phosphatidylcholine (PC) and can be characterized by the following general formula:



wherein R typically represents linear aliphatic hydrocarbon moieties having 15 to 17 carbon atoms and up to 4 cis-double bonds. Examples of natural lecithins are compounds from the group of Cephalins, which are also referred to as phosphatide acids, and derivatives of 1,2-diacyl-sn-glycerin-3-phosphoric acids.

Examples of suitable phospholipids are mono-esters and, preferably, di-esters of phosphoric acids and glycerin (i.e. glycerin phosphates), which are generally regarded as fatty substances. Sphingosines or better sphingolipids are other examples of suitable additives.

Metal salts of fatty acids, such as magnesium- aluminum- and/or zinc stearate respectively -ricinoleate can be employed as stabilizing agents.

Suitable biologically active additives include tocopherol, tocopherol acetate, tocopherol palmitate, ascorbic acid, desoxyribonucleic acid, retinol, bisabolol, allantoin, phytantriol, panthenol, AHA acids, amino acids, ceramides, pseudoceramides, essential oils, plant extracts and vitamin C complexes.

Cosmetic anti bacterial agents are active against the development of body odors. Body odors develop due to the activity of dermal bacteria on apocrine perspiration, during which unpleasantly smelling metabolites are formed.

Suitable anti bacterial agents include germination inhibiting compounds which are in principle active against all gram positive bacteria, such as 4-hydroxybenzoic acid and salts plus esters thereof, N-(4-chlorophenyl)-N'-(3,4 dichlorophenyl)urea, 2,4,4'-trichloro-2'-hydroxy-diphenyl ether (Triclosan), 4-chloro-3,5-dimethylphenol, 2,2'-methylene-bis(6-brom-4-chlorophenol), 3-methyl-4-(1-methylethyl)phenol, 2-benzyl-4-chlorophenol, 3-(4-chlorophenoxy)-1,2-propanediol, 3-iodo-propinylbutyl carbamate chlorohexidin, 3,4,4'-trichloro carbanilide (TTC), antibacterial fragrant compounds, thymol, thymian oil, eugenol, clove oil, menthol, mint oil, fernesol,

phenoxyethanol, glycerin-monolaurate (GML), diglycerin-monocaprinat (DMC), salicylic acid-N-alkylamide such as salicylic acid-n-octylamide or salicylic acid-n-decylamide. Furthermore enzyme inhibitors can be used to help to prevent the production of undesired body odors. Esterase inhibitors, for example, are suitable for this purpose in compositions according to the invention. Preferred enzyme inhibiting agents are trialkylcitrate, such as trimethylcitrate, tripropylcitrate, triisopropylcitrate, tributylcitrate and in particular triethylcitrate (Hydragen® Cat, Henkel KGaA, Dusseldorf/FRG). The compounds inhibit the enzyme activity and reduce the formation of odorous compounds. Other suitable esterase inhibiting compounds are for example sterolsulphates or -phosphates, such as lanosterin-, cholesterol-, campesterin-, stigmasterin and sitosterinsulphate respectively -phosphate. Dicarboxylic acids and esters thereof, such as glutaric acids, glutaric acid mono-ethylesters, adipinic acid, adipinic acid monoethylester, adipinic acid diethylester, malonic acids and malonic acid diethyl ester, hydroxycarboxylic acids and esters thereof such as citric acid, malic acid, tartaric acid or tartaric acid diethylester as well as zinc glycinate.

In addition odor-absorbing agents may be used to suppress the formation of a undesired scent. Suitable compounds decrease the partial pressure of the single components and as such decrease the velocity of spreading. It is important that perfume compositions are not absorbed significantly. Odor-absorbing agents are normally not directly active against bacteria. They comprise for example as primary component a complex of a zinc salt of ricinoleic acid or special fragrance-neutral perfume compounds, known to the skilled professional as fixatives. Examples of these fixatives are labdanum extracts respectively Styrax or certain abietic acid derivatives. Furthermore perfume compounds, including fragrant oils, may serve as masking agents and also may give a typical fragrant character to compositions. Examples of fragrant oils are mixtures of natural and synthetic fragrant compounds. Examples of natural fragrant compounds are extract of flowers, stems, leafs, fruits, fruit skin, fruit peel, roots, woods, herbs, grasses, needles and branches, as well as resins and balms. Furthermore materials of animal origin are suitable, such as civet or castoreum. Typical synthetic fragrant compounds are esters, ethers, aldehydes, ketones, alcohols and hydrocarbons. Examples of fragrant esters as benzylacetate, p-tert-butylcyclohexylacetate linalyl acetate, phenylethylacetate, benzylbenzoate,

benzylformiate, allylcyclohexyl-propionate, styrallylpropionate and benzylsalicytate. An example of a suitable ether is benzylethyl ether. Examples of suitable aldehydes are linear alkanals having 8-18 carbon atoms, citral, citronellal, citronellyloxyacetyl aldehyde, cyclamen aldehyde, hydroxycitronellal, lillial and bourgeonal. Examples suitable ketones are jonones and methylcedrylketone. Examples of suitable alcohols are anethol, citronellol, eugenol, isoeugenol, geraniol, linalool, phenylethyl alcohol and terpineol and examples, of the hydrocarbons mainly terpenes and balms. Preferably mixtures of different fragrant compounds, resulting in a pleasant aroma, are employed. Also commonly used aromatic compounds of the group of etheric oils of low volatility, are suitable perfume oils. Examples of these are sage oil, camille oil, clove oil, balm mint oil, mint oil, cinnamon oil, linden-blossom oil, juniper oil, vetiver oil, olibanum oil, galbanum oil, labdanum oil and lavender oil. Preferred are bergamot oil, dihydromyrcenol, lilial, lyral, citronellol, phenylethyl alcohol,  $\alpha$ -hexylcinnamonaldehyde, geraniol, benzylacetone, cyclamen aldehyde, linalool, boisambrene forte, ambroxan, indol, hedione, sandelice, citron-oil, mandarin-oil, orange-oil, allylamylglycolate, cyclovertal, lavender-oil, muscate sage-oil,  $\beta$ -damascone, geranium-oil bourbon, cyclohexylsalicylate, vertofix coeur, iso-E-super, fixolide NP, evemyl, iraldein gamma, phenyl-acetic acid, geranyl acetate, benzyl acetate, rose-oxide, romilate, irotyl and floramate, either employed alone or in a mixture.

Anti-perspirants reduce the formation of perspiration by influencing the activity of exocrine perspiratory glands, and as such help to prevent wetting of arm pits as well as the formation of body odors. Aqueous or non aqueous compositions of Anti-perspirants typically comprise the following ingredients:

- astringent agents;
- oil compounds;
- non ionic emulsifying agents;
- co-emulsifying agents;
- strength improving agents;
- aiding compounds such as thickening agents or complexing agents; and/or



- non-aqueous solvents such as ethanol, propyleneglycol; and/or glycerin.

Examples of astringent agents are in particular all salts of

aluminum, zirconium and zinc, such as aluminumchloride, aluminumchlorohydrate, aluminumdichlorohydrate, aluminumsesquichlorohydrate, and complexes thereof, e.g. with propyleneglycol-1,2. Aluminumhydroxyallantoinate, aluminumchloridetartrate, aluminum-zirconium-trichlorohydrate, aluminum-zirconium-tetrachlorohydrate, aluminum-zirconium-pentachlorohydrate and complexes thereof, for example with amino acids such as glycine. In addition anti-perspirants may comprise the usual oil soluble and water soluble aiding agents in lower concentrations. Examples of oil soluble aiding agents are:

- infection inhibiting, skin protecting or fragrant etheric oils;
- synthetic skin protecting agents; and/or
- oil soluble perfume oils.

Suitable antidandruff agents are for example Octopirox® (1-hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2-(1H)-pyridon-monoethanolamine salt, Babyprival, Pirocton Olatin, Ketoconazol®, (4-acetyl-1-{4-[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3-dioxylane-c-4-ylmethoxyphenyl]piperazin, selenedisulfide, sulfur colloids, sulfurpolyethyleneglycolsorbitol-monooleate, sulfuricin-polyethoxylate, sulfurtar distillate, salicylic acid (in particular in combination with hexachlorophen), undecylene acid monoethanolamide sulfosuccinate Na-salt, Lamepon® UD (protein-undecylene acid condensate, zincpyrethione, aluminumpyrethione and magnesiumpyrethione/dipyrrethione-magnesiumsulfate).

Usual film-forming agents include chitosan, micro crystalline chitosan, quaternary chitosan, polyvinylpyrrolidone, vinylpyrrolidone-vinylacetate-copolymerisate, polymers of acrylic acid, quaternary cellulose derivatives, collagen, hyaluronic acid, respectively salts thereof and similar compounds.

Suitable swelling agents for aqueous phases include montmorillonites, clay mineral compounds, pemules, as well as alkylated carbopol types (Goodrich). Furthermore, polymers suitable as swelling agents can be found in the overview by R. Lochhead in cosm. Toil. 108, 95 (1993).

Suitable UV-filters are for example compounds - liquid or crystalline at room temperature - that are capable of absorbing ultraviolet radiation and of releasing the absorbed energy in the form of electromagnetic radiation of a longer wavelength, e.g. in the form of infra red radiation. UVB filters may be oil soluble or water soluble. Examples of oil soluble compounds are:

- 3-benzylidencamphor respectively 3-benzylidennorcamphor and derivatives thereof, such as 3-(4-methylbenzyliden)camphor as further described in EP 0693471;
- 4-aminobenzoic acid derivatives, preferably 4-dimethylamino-benzoic acid-2-ethylhexyl ester, 4-(dimethylamino)benzoic acid-2-octyl ester and 4-dimethylamino)benzoic acid amyl ester;
- esters of cinnamon acid, preferably 4-methoxy-cinnamon-2-ethylhexyl ester, 4-methoxy-cinnamon acid propyl ester, 4-methoxy-cinnamon acid isoamyl ester 2-cyano-3,3-phenyl cinnamon acid-2-ethylhexyl ester (octocrylene);
- esters of salicylic acid, preferably salicylic acid-2-ethylhexyl ester, salicylic-4-isopropylbenzyl ester, salicylic acid homomenthyl ester;
- derivatives of benzophenones, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-di-hydroxy-4-methoxybenzophenone;
- esters of benzalmalon acid, preferably 4-methoxybenzamalonal di-2-ethylhexyl ester;
- triazin derivatives, e.g. 2,4,6-trianilino-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazin and octyl triazon, as described in EP 0 818 450 A1 or dioctyl butamido triazone (Uvasorb® HEB);
- propane-1,3-dione, e.g. 1-(4-tert butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione;
- ketotricyclo(5.2.1.0)decane-derivatives as described in EP 0 694 521 B1.

Examples of water soluble UV-filters are:

- 2-phenylbenzimidazol-5-sulfonic acid and alkali-, earth alkali-, ammonium-, alkylammonium-, alkanolammonium- and glucammonium salts thereof;

- sulfonic acid derivatives of benzophenon, preferably 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid and salts thereof;
- sulfonic acid derivatives of 3-benzylidencamphors, e.g. 4-(2-oxo-3-bornylidenemethyl)benzol-sulfonic acid and 2-methyl-5-(2-oxo-3-bornylidene)sulfonic acid and salts thereof.

Typical examples of UV-A filters are derivatives of benzoylmethane, such as 1-(4'-tert.butylphenyl)-3-(4'-methoxyphenyl)-propane-1,3-dione as well as enamine compounds as described in DE 19712033 A1 (BASF). Naturally it is possible to employ mixtures of UV-A and UV-B filters. In addition to the already mentioned soluble compounds, non-soluble sun-screen pigments may also be employed. In particular small dispersed metal oxide particles and metal salts, such as zinc oxide, titanium dioxide, oxides of respectively iron, zirconium, silicium, manganese, aluminum and cerium, as well as mixtures thereof, the salts of silicates (talcum), barium sulfate and zinc stearate. The oxides and salts are employed in compositions for skin care or skin protective emulsions and in decorative cosmetics. The particles should have an average diameter of less than 100 nm, preferably between 5 and 50 nm, more preferably between 15 and 30 nm. The particles may have a spherical, ellipsoidal or other shape. Optionally the surfaces of pigments may have been treated, i.e. by hydrophilization or hydrophobization. Typical examples are coated titanium dioxide, such as titanium dioxide T 805 (Degussa) or Eusolex® T2000 (Merck). Typical examples of hydrophobic coating agents are silicones, and particularly trialkoxyoctylsilanes or Simethicones. So called micro- or nanopigments are preferably employed in sun screen compositions. Preferably micronized zinc oxide is used. Further examples of suitable UV-filters can be found in the overview of P. Finkel in SÖFW-Journal 122, 543 (1996).

In addition to the groups of primary light protective agents, as mentioned above, it is also possible to use secondary light protective agents of the group of antioxidants which can stop photochemical reaction chains. These photochemical reactions are induced by UV-radiation as it enters the skin. Typical examples of suitable antioxidants are amino acids such as glycine, histidin, tyrosine, tryptophane, and derivatives thereof, imidazols such as urocaninic acid, and derivatives thereof, peptides, e.g. D,L-carnosin, D-carnosin, L-carnosin and their derivatives (e.g. anserin), carotinoids, carotins, (e.g.  $\alpha$ -carotin,  $\beta$ -carotin, lycopin) and derivatives thereof, chlorogenic acid and

their derivatives, liponic acids and their derivatives (e.g. dihydroliponic acid), aurothioglucose, propylthiouracil, and other thiols (e.g. thioredoxin, glutathion, cystein, cystin, cystamin, and glycosyl-, N-acetyl-, methyl-, ethyl-, propyl-, amyl-, butyl- and lauryl-, palmitoyl-, oleyl-,  $\gamma$ -linoleyl-, cholesteryl- and glyceryl-ester), as well as, salts thereof, dilaurylthiodipropionate distearylthiodipropionate thiodipropionic acid and derivatives thereof (esters, ether, peptide, lipide, nucleotide, nucleoside and salts), as well as, sulfoximins (e.g. buthioninisulfoximine, homocysteinsulfoximine, butioninsulfone-, penta-, hexa-, heptathioninsulfoximine) in very low tolerable concentrations (e.g. pmol to  $\mu$ mol/kg), further (metal)-chelators (e.g.  $\alpha$ -hydroxy fatty acids, palmitine acids, phytine acids, lactoferrin),  $\alpha$ -hydroxy acids, such as citric acid, lactic acid or malic acid, humic acid, bile acid, bile extracts, bilirubin, biliverdin, EDTA, EGTA and derivatives thereof, unsaturated fatty acids and derivatives thereof, such as  $\gamma$ -linolenic acid, linoleic acid or oleic acid, foleic acid and derivatives thereof, ubiquinone, ubiquinol, and derivatives thereof, vitamin C and derivatives, such as ascorbylpalmitate, Mg-ascorbylphosphate or ascorbylacetate, tocopherols and derivatives, such as vitamin-E-acetate, vitamin A and derivatives, such as vitamin-A-palmitate, as well as conferylbenzoate of benzoin resin, rutinic acid and derivatives thereof,  $\alpha$ -glycosylrutine, ferulic acid, furfurylidenglucitol, carnosin, butylhydroxytoluol, butylhydroxyanisol, nordihydroguaiaretic acid resin, nordihydroguaiaretic acid, trihydroxybutyrophenon, uric acid and derivatives thereof, mannose and derivatives thereof, superoxide dismutase, zinc and derivatives thereof, such as ZnO and ZnSO<sub>4</sub>, selenium and derivatives thereof, such as selenium-methionin, stilbenes and derivatives thereof, such as stilbeneoxide, trans stilbene oxide, and the suitable derivatives (salts, esters, ethers, sugars, nucleotides, nucleosides, peptides, lipids) of the mentioned agents.

In order to improve flowability it is possible to add hydrotropes, such as ethanol, isopropanol, or polyols. Preferred polyols have 2 to 15 carbon atoms and at least 2 hydroxyl groups. The polyols may have additional functional groups, in particular amino groups, respectively they may be modified with nitrogen. Typical examples are:

- glycerin;
- alkyleneglycols, such as ethyleneglycol, diethyleneglycol, propylene glycol, butylene glycol, hexylene glycol as well as

polyethyleneglycols with a average molecular weight of 100 to 1000 Dalton;

- technical oligoglycerin mixtures with a self condensation degree of 1.5 to 10 such as technical diglycerin mixtures with a diglycerin concentration of 40 to 50 % w/w;
- methanol compounds, in particular trimethylethane, trimethylolpropane, trimethylolbutane, pentaerythrite and dipentaerythrite;
- lower alkylglucosides, in particular those having 1 to 8 carbon atoms in alkyl group, such as methyl- and butylglucoside
- sugar alcohols having 5 to 12 carbon atoms, such as sorbitol or mannitol;
- sugars having 5 to 12 carbon atoms, such as glucose or saccharose
- amino sugars, such as glucamine;
- dialcoholamines such as diethanolamine or 2-amino-1,3-propanediol.

Examples of suitable preservatives are phenoxyethanol, formaldehyde, parabene, pentadiol or sorbic acid, as well as compounds mentioned in "Anlage 6, Teil A und B der Kosmetikverordnung". Examples of suitable insect-repellents are N,N-diethyl-m-toluamide, 1,2-pentadiol or ethyl butylacetylaminopropionate. Dihydroxy-aceton is a suitable tanning agent. Suitable tyrosine inhibitors - which prevent the formation of melanin and are employed in depigmentation agents - are for example arbutin, koji acid, coumarinic acid and ascorbic acid (vitamin C).

Suitable perfume oils are mixtures of natural and synthetic fragrant compounds. Natural fragrant compounds include extracts of flowers, such as lily, lavender, rose, jasmine, neroli and ylang-ylang, stems and leaves such as geranium, patchouli, petit-grain, fruits such as aniseed, coriander, cumin, juniper, fruit skins or peels, such as those of bergamot, lemons, oranges, roots such as macis, angelica, celery, cardamom, costus, iris, calamus, woods such as pine, sandal, guaiac, cedar and rose, herbs and grasses such as, estragon, lemon grass, sage, thyme, needles and branches, grove, spruce, pine, larch, resins and balms, such as galbanum, elemi, benzoe, myrrh, olibanum, opoponax. Furthermore materials of animal origin can be used such as civet and castoreum. Typical synthetic fragrant compounds are esters, ethers,

aldehydes, ketones, alcohols and hydrocarbons. Examples of suitable esters are benzylacetate, phenoxyethylisobutyrate, p-tert.-butylcyclohexylacetate, linalylacetate, dimethylbenzylcarbinyacetate, phenylethylacetate, linalylbenzoate, benzylformiate, ethylmethylphenylglycinate,

- 5 allylcyclohexylpropionate, styrylpropionate and benzylsalicylate. Examples of suitable ethers are benzylethyl sethers, examples of suitable aldehydes are linear alkanals having 8 to 18 carbon atoms, citral, citronellal, citronellyloxyacetaldehyde, cyclamealdehyde, hydroxycitronellal, linal and bourgeonal, examples of suitable ketones are jozones,  $\alpha$ -isomethylinon and
- 10 methylcedrylketon, Examples of suitable alcohols are anethol, citronellol, eugenol, iso-eugenol, geraniol, linalool, phenylethylalcohol and terpineol. Primary examples of hydrocarbons are terpenes and balms. Preferably however, mixtures of several fragrant compounds are employed, together resulting in a preferred aroma. In addition, etheric oils of low volatility, are
- 15 suitable perfume oils. Examples of these are sage oil, camille oil, clove oil, balm mint oil, mint oil, cinnamon oil, linden-blossom oil, juniper oil, vetiver oil, olibanum oil, galbanum oil, labolanum oil and lavender oil. Preferred are bergamot oil, dihydromyrcenol, linal, lyral, citronellol, phenylethyl alcohol,  $\alpha$ -hexylcinnamon aldehyde, geraniol, benzylacetone, cyclamen aldehyde, linalool,
- 20 boisambrene forte, ambroxan, indol, hedione, sandelice, citron-oil, mandarin-oil, orange-oil, allylamylglycolate, cyclovertal, lavender-oil, muscate sage-oil,  $\beta$ -damascone, geranium-oil bourbon, cyclohexylsalicylate, vertofix coeur, iso-E-super, fixolide NP, evemyl, iraldein gamma, phenyl-acetic acid, geranyl acetate, benzyl acetate, rose-oxide, romilate, irotyl and floramate, either
- 25 employed alone or in a mixture.

Suitable colorants are any colorants that are suitable for cosmetic purposes, as for example mentioned in the publication "Kosmetische Farbmittel" der Farbstoff-kommission der Deutschen

- Forschungsgemeinschaft, Verlag Chemie, Weinheim, 1984, S. 81-16". Such colorants are usually employed in concentrations varying from 0.001 to 0.1 % w/w based on the weight of the composition.
- 30

The total amount of additives can vary from 1 to 50 preferably from 5 to 40 % w/w based on the weight of the composition.

The balance of the composition will generally be made up by water.

- 35 Optionally, a small amount of an alcohol, such as ethanol or isopropanol may be present, e.g. to achieve a disinfecting effect. Water will typically be present

in an amount ranging from 50 to 95 wt.%, based on the weight of the composition.

The compositions can be prepared according to the usual cool or heated processes; a preferred method of preparation is a phase-inversion temperature method.

Dependent on the chosen ingredients of the composition as set forth above, a cosmetics composition according to the invention may find application as a sun cream or lotion, body milk, shampoo, bathing or shower gel, hair care product, deodorant or moisturizing cream. If desired, the present composition may also be employed in a pharmaceutical setting, for instance as an ointment. In such a case, the composition will further comprise a pharmaceutically active agent or a bioactive agent.

The invention will now be elucidated by the following, non-restrictive examples.

#### Example 1

A composition was prepared of the following ingredients in the following amounts (wt.%):

- Surfactants:	Magnesium Laureth Sulfate (1)	11.43
	Lauryl Glucoside (2)	5.19
- pH regulator:	Citric acid	0.11
- Preservative:	Kathon CG	0.06
- Thickener:	Xanthan gom	0.80
- Moisturizing agent:	Glycerin	5.00
- Emollient:	Cetiol HE	2.00
- Conditioning agent:	Merquat Plus 3331	1.00
- Perfume		1.00
- Coloring agent:	Patentblue V E 131	0.0015
- Water		Balance

The composition was prepared by first adding the water to a vessel. Next, in subsequent order, the preservative and the thickener were added. These components were mixed and homogenized until the thickener was swollen and fully dispersed. To the obtained dispersion, the surfactants were added separately with mixing to fully disperse the surfactant after each

addition. The remaining ingredients, except the citric acid, were then added and mixing was continued until all were fully dispersed. Finally, the pH was adjusted by addition of the citric acid.

This composition was then cooled to below 10°C. The propellant to be added, isopentane, was also cooled to said temperature. The composition and the propellant were mixed with one another while taking care that no air was incorporated at constant temperature. The propellant was added in an amount to finally reach a concentration of 6 wt.%, with respect to the total weight of the final composition. After thorough mixing, the composition was allowed to warm up and brought into a suitable plastic container while still having a temperature below 20°C.

### Example 2

Six compositions were prepared. Three were in accordance with the present invention (A, B, C), and three were not (CA, CB, CC). For the preparation of the compositions, a surfactant mixture comprising a thickener was mixed with pentane at a pH of 5.5-6.5. The viscosities were measured using the Brookfield method at 23°C ('Spindel TE', 5 rpm) in mPas. The results are shown in Table 1.

Table 1: Gels of surfactant mixtures (amounts in weight percentages)

Composition	A	B	C	CA	CB	CC
Texapon® N70 Sodium Laureth Sulfate	8	8	4	8	8	4
Plantacare® 818 Coco-Glucosid	1	-	1	1	-	1
Dehyton® K Cocoamidopropylbetain	1	1	1	1	1	1
Glyceryl-PEG-140- tristearate	4	4	4	4	4	4
Pentane	6	6	6	-	-	-
Water	ad 100					
Viscosity						
- 1 hour	30,500	25,000	34,000	3000	3200	2900
- 4 weeks	29,600	27,000	34,500	2700	2800	2600



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### Amended Claims

1. Cosmetics composition comprising a thickener, isopentane as propellant, a surfactant and water, wherein the composition is contained in a container under a pressure of at least 0.1 bar in excess of atmospheric pressure and below 3 bar.
- 5 2. Composition according to claim 1, wherein the pressure is no more than 2 bar.
3. Composition according to claim 1 or 2, wherein the container is a plastic container.
4. Composition according to any of the claims 1-3, wherein said
- 10 composition comprises at least two surfactants and a hydrophobic compound having a HLB-value of less than 10 wherein said composition further has a viscosity according to Brookfield (23°C, Spindle TE, 5 RPM) of in the range of 5,000 to 50,000 mPas.
5. Composition according to any of the preceding claims, comprising \*
- 15 from 0.01 to 30 wt.% of thickener, from 1 to 15 wt.% of propellant, from 0.5 to 50 wt.% of surfactant and the balance being water and other customary body care ingredients.
6. Composition according to any of the preceding claims, wherein the thickener is chosen from the group of gums, poly(meth)acrylates, polymers
- 20 based upon aerosil-types, polysaccharides, high molecular polyethyleneglycolmono- and diesters of fatty acids, polyacrylamides, polyvinylalcohols, polyvinylpyrrolidons, esters of fatty acids with polyols, fatty alcoholethoxylates, alkyloligoglucosides and sugar-esters.
7. Composition according to claim 6, wherein the thickener is chosen
- 25 from xanthan gom, guar-guar, agar-agar alginates, tyloses, carboxymethylcellulose, hydroxyethylcellulose.

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8. Composition according to any of the preceding claims further comprising one or more ingredients chosen from the group of pH regulating agents, oil bodies, emulsifying agents, preservatives, perfumes, moisturizing agents, UV-filters, emollients, superfatting agents, brighteners, strength
- 5 improving agents, silicon agents, fats, waxes, lecithins, phospholipids, stabilizing agents, anti-bacterial agents and other bioactive agents, odor-absorbing agents, antiperspirants, antidandruff agents, film-forming agents, swelling agents, antioxidants, insect-repellents, hydrotropes, tanning agents, tyrosin inhibitors, solubilizers and colorants.
- 10 9. Composition according to any of the preceding claims, wherein said composition comprises a fatty alcohol preferably of the formula  $R_1OH$ ,  $R_1$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms and 0, 1, 2, or 3 double bonds.
10. Composition according to any of the preceding claims, wherein said
- 15 composition comprises a fatty alcoholalkoxylate preferably of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 6 to 22 carbon atoms,  $m$  being an integer from 1 to 30 and  $AlkO$  being an alkyleneoxide.
11. Composition according to any of the preceding claims, wherein said
- 20 composition comprises a fatty alcoholalkoxylate of the formula  $R_2O(AlkO)_mH$ ,  $R_2$  being an aliphatic hydrocarbon group containing 8 to 22 carbon atoms,  $m$  being an integer from 5 to 20 and  $AlkO$  being chosen from ethyleneoxide and propylene oxide.
12. Composition according to any of the claim 4 to 11, wherein the
- 25 viscosity according to Brookfield (23°C, Spindle TE, 5 RPM) of said composition is in the range of 10,000 to 50,000, preferably in the range of 20,000 to 30,000 mPa.s.
13. Composition according to any of the preceding claims wherein said composition is a gel.

14. Composition according to any of the preceding claims wherein said composition comprises:

- a) 0.01 to 30 % w/w of a thickener,
- b) 0.1 to 20 % w/w of a hydrophobic compound having an HLB value of less than 10,
- c) 0.5 to 40 % anionic surfactants,
- d) 0.25 to 5 % amphoteric surfactants, and/or
- e) 0.5 to 40 % nonionic surfactants,

10 and is further characterized by the composition having a viscosity of 5,000 to 50,000 mPas and the weight ratio of components c:d or c:e being in the range of 2:1 to 8:1.

15. Container comprising a cosmetics composition according to any of the preceding claims.

15 16. Use of a composition according to any of the claims claim 1-14 as a sun cream or lotion, body milk, shampoo, bathing or shower gel, ointment, deodorant, hair care product or moisturizing cream.

17. Use of isopentane as a propellant incorporated into a cosmetics composition.

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25 May 2001For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
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A SURFACTANT(57) Abstract: The invention relates to a cosmetics composition comprising a thickener, a propellant, a surfactant and water, wherein  
the composition is contained in a container under a pressure of no more than 3 bar.

**Declaration and Power of Attorney Patent Application  
(Design or Utility)**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: "Cosmetics composition".

the specification of which

- ☐ is attached hereto  
☒ was filed on February 12, 2002, as application serial no. 10/049,895 and or PCT International Application number PCT/NL00/00589 and was amended on (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 35 U.S.C. §365(b) of any foreign application(s) for patent or inventor's certificate, or 35 U.S.C. §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate of PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)		
Number 199 41 833.7	Country DE	Day/Month/Year Filed 30 August 1999
Number 00200043.8	Country EP	Day/Month/Year Filed 6 January 2000
Number	Country	Day/Month/Year Filed

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

Prior Provisional Application(s)	
Serial Number	Day/Month/Year Filing Date
Serial Number	Day/Month/Year Filing Date
Serial Number	Day/Month/Year Filing Date

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or under 35 U.S.C. §365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. or International Application(s)		
Serial Number	Day/Month/Year Filed	Status (issued, pending, abandoned)
Serial Number	Day/Month/Year Filed	Status (issued, pending, abandoned)
Serial Number	Day/Month/Year Filed	Status (issued, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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### Declaration and Power of Attorney Patent Application (Design or Utility)

As a below named inventor, I hereby declare that: ✓

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: "Cosmetics composition".

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Signature of Inventor		Date

Full Name of Second Inventor, if any		
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Full Name of Third Inventor, if any		
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Signature of Inventor		Date

Full Name of Fourth Inventor, if any		
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Signature of Inventor		Date

**Declaration and Power of Attorney Patent Application  
(Design or Utility)**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: "Cosmetics composition".

the specification of which

- ☐ is attached hereto  
☒ was filed on February 12, 2002, as application serial no. 40/049,895 and or PCT International Application number PCT/NL00/00599 and was amended on (if applicable),

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Signature of Inventor <i>Herman Hensen</i>		Date <i>13 9 82</i>

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Signature of Inventor <i>Peter Schmiedel</i>		Date <i>27 04 82</i>

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1-0

Full Name of Sole or First Inventor		
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City of Residence Den Haag	State or Country of Residence the Netherlands <i>MLV</i>	Country of Citizenship Germany
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Street Address Sportlaan 157	City Den Haag	State & Zip Code or Country 2566 KA
Signature of Inventor <i>Eckart Voss</i>		Date 21. 09. 02

2-0

Full Name of Second Inventor, if any		
Family Name Knebel	First Given Name Silke	Second Given Name Katharina
Residence and Citizenship		
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3-0

Full Name of Third Inventor, if any		
Family Name Monreal	First Given Name Michele	Second Given Name
Residence and Citizenship		
City of Residence Kürten	State or Country of Residence Germany <i>MLV</i>	Country of Citizenship Germany
Post Office Address		
Street Address Kölnerstrasse	City Kürten	State & Zip Code or Country D-51515
Signature of Inventor		Date

4-0

Full Name of Fourth Inventor, if any		
Family Name Withell	First Given Name Trevor	Second Given Name Keith
Residence and Citizenship		
City of Residence Düsseldorf	State or Country of Residence Germany <i>MLV</i>	Country of Citizenship Great Britain
Post Office Address		
Street Address Drögelsberg	City Düsseldorf	State & Zip Code or Country D-40489
Signature of Inventor		Date



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Full Name of Fifth Inventor, if any		
Family Name Nieman	First Given Name Gerrit	Second Given Name
Residence and Citizenship		
City of Residence Zoetermeer	State or Country of Residence the Netherlands	Country of Citizenship the Netherlands
Post Office Address		
Street Address Lijnbaan 241	City Zoetermeer	State & Zip Code or Country 2728 AE
Signature of Inventor		Date

600

Full Name of Sixth Inventor, if any		
Family Name Hensen	First Given Name Herman	Second Given Name
Residence and Citizenship		
City of Residence Haan	State or Country of Residence Germany	Country of Citizenship Germany
Post Office Address		
Street Address Rathmacherweg 13	City Haan	State & Zip Code or Country D-42781
Signature of Inventor		Date

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Full Name of Seventh Inventor, if any		
Family Name Schmiedel	First Given Name Petr	Second Given Name
Residence and Citizenship		
City of Residence Düsseldorf	State or Country of Residence Germany	Country of Citizenship Germany
Post Office Address		
Street Address Hasslestrasse 62	City Düsseldorf	State & Zip Code or Country D-40599
Signature of Inventor		Date